Modeling human development and disease in cerebral organoids

Abstract

The human brain is unique in size and complexity, but also the source of some of the most devastating human diseases. While many of these disorders have been successfully studied in model organisms, recent experiments have emphasized unique features that can not easily be modeled in animals. We use cerebral organoids to recapitulate those features in vitro and to test their role in human disease. Cerebral organoids derived from patients suffering from neuro-developmental disease can recapitulate the developmental defects leading to those diseases and allow us to disentangle the mechanistic complexity of disorders like Epilepsy and Autism. Our new data demonstrate that by studying those defects, we can gain unique insights into the development of the human cortex that cannot be made in rodent model organisms.